PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	Joseph A. FERNANDO, et al.	Docket No.:	UNF-9058-A
Serial No.	09/560,469	Examiner:	Jennifer A. LEUNG
Filing Date:	April 28, 2000	Group Art Unit:	1774 Conf. No.: 3786
Title:	SUPPORT ELEMENT FOR FRAGILE STRUCTURES SUCH AS CATALYTIC CONVERTERS		

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APPELLANTS' REPLY BRIEF UNDER 37 C.F.R. § 41.41

To the Honorable Commissioner For Patents:

I. INTRODUCTORY COMMENTS

This is a Reply Brief submitted in response to the Examiner's Answer mailed July 5, 2011, which is in response to Appellants' Brief under 37 C.F.R. §41.37 appealing to the Board of Patent Appeals and Interferences (the "Board") from the final rejection set forth in the Office Action mailed May 19, 2010. The Notice of Appeal was filed on September 20, 2010. The appeal is of pending claims 1, 2, 5-13, 16-27, 41-44 and 47-57.

The **Status of Claims** begins on Page 2.

The **Grounds of Rejection to Be Reviewed on Appeal** begins on Page 3.

The **Remarks** begins on Page 4.

II. STATUS OF CLAIMS

The present application was filed on April 28, 2000 with original claims 1-40. Claims 41-46 were added by preliminary amendment filed June 5, 2002. Claims 3 and 14 were canceled by Appellants' response mailed August 19, 2005. Claims 4, 15, 28-40, 45 and 46 were canceled and claims 47-57 were added by Appellants' Response mailed April 27, 2006. A Request for Continued Examination for this application was filed with the Office on April 21, 2010. A Final Office Action for this application, subsequent to Appellants' Request for Continued Examination, was mailed by the Office on May 19, 2010.

Claims 1, 2, 5-13, 16-27, 41-44 and 47-57 are currently under final rejection and constitute the claims on appeal.

III. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

WITHDRAWN REJECTIONS

The Examiner has withdrawn the following grounds for rejection:

A. The rejection of claims 1, 2, 5, 6, 8-13, 16, 17, 19-27, 47-50 and 52-57 under 35 U.S.C. §103(a) as being unpatentable over Robinson et al. (U.S. Patent No. 5,580,532) in view of Myles (U.S. Patent No. 4,240,833).

B. The rejection of claims 7, 18, 41-44 and 51 under 35 U.S.C. §103(a) as obvious over Robinson et al. (U.S. Patent No. 5,580,532) in view of Myles (U.S. Patent No. 4,240,833), as applied to claims 1, 9, 12 and 21, and further in view of Sasaki et al. (JP 07-286514).

NEW GROUNDS OF REJECTION

The Examiner has issued the following new grounds for rejection in the Examiner's Answer of July 5, 2011. Thus, the rejections to be reviewed in the present appeal are:

A. Rejection Under 35 U.S.C. § 103(a) of Claims 1, 2, 5, 6, 8-13, 16, 17, 19-27, 47-50 and 52-57

The rejection of claims 1, 2, 5, 6, 8-13, 16, 17, 19-27, 47-50 and 52-57 under 35 U.S.C. §103(a) as being unpatentable over Robinson et al. (U.S. Patent No. 5,580,532) in view of Myles (U.S. Patent No. 4,240,833) and Langer (U.S. Patent No. 5,250,269).

B. Rejection Under 35 U.S.C. § 103(a) of Claims 7, 18, 41-44 and 51

The rejection of claims 7, 18, 41-44 and 51 under 35 U.S.C. § 103(a) as being unpatentable over Robinson et al. (U.S. Patent No. 5,580,532) in view of Myles (U.S. Patent No. 4,240,833) and Langer (U.S. Patent No. 5,250,269), as applied to claims 1, 9, 12 and 21, and further in view of Sasaki et al. (JP 07-286514).

IV. REMARKS

United States Serial No. 09/560,469 was filed on April 28, 2000. Claims 1, 2, 5-13, 16-27, 41-44 and 47-57 are currently pending. In view of the remarks set forth herein, Appellants respectfully request reconsideration and allowance of claims 1, 2, 5-13, 16-27, 41-44 and 47-57.

I. Rejection Under 35 U.S.C. §103(a) of Claims 1, 2, 5, 6, 8-13, 16, 17, 19-27, 47-50 and 52-57

The Examiner's Answer rejected claims 1, 2, 5, 6, 8-13, 16, 17, 19-27, 47-50 and 52-57 under 35 U.S.C. § 103(a) as being unpatentable over Robinson et al. (U.S. Patent No. 5,580,532) in view of Myles (U.S. Patent No. 4,240,833) and Langer (U.S. Patent No. 5,250,269) for the reasons set forth on pages 6-9 of the Examiner's Answer. Appellants respectfully traverse this rejection.

Independent claim 1 is directed to a device for the treatment of automotive exhaust gases comprising a housing having an inlet at one end and an outlet at an opposite end through which exhaust gases flow; a fragile structure resiliently mounted within the housing, the fragile structure having an outer surface and an inlet end surface at one end in communication with said inlet of said housing and an outlet end surface at an opposite end in communication with said outlet end of said housing; a support element disposed between the housing and the fragile structure, said support element comprising an integral, substantially non-expanding ply of melt-formed ceramic fibers comprising about 40 weight percent to about 60 weight percent alumina and about 60 weight percent to about 40 weight percent silica, and a sacrificial binder, wherein said fibers having been prepared by a process including heat treating said fibers under a time-temperature regimen comprising heat treating said fibers at a temperature of 990°C to at least 1050°C for greater than 1 hour such that the treated fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of greater than 200Å to about 500Å; and wherein said support element exerts a minimum residual pressure for holding said fragile structure within said housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C.

Independent claim 12 is directed to a device for the treatment of automotive exhaust gases comprising a housing having an inlet at one end and an outlet at an opposite end through which exhaust gases flow; a fragile structure resiliently mounted within said housing, said fragile structure having an outer surface and an inlet end surface at one end in communication with said inlet of said housing and an outlet end surface at an opposite end in communication with said outlet end of said housing; a support element disposed between the housing and the fragile structure, said support element comprising an integral, substantially non-expanding ply of melt-formed ceramic fibers comprising about 40 weight percent to about 60 weight percent alumina and about 60 weight percent to about 40 weight percent silica, and a sacrificial binder, wherein said fibers having been prepared by a process of heat treating said fibers under a time-temperature regimen comprising heat treating said fibers at a temperature of greater than 1050°C for an effective amount of time such that the treated fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of greater than 200Å to about 500Å; wherein said support element exerts a minimum residual pressure for holding said fragile structure within said housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C.

Independent claim 47 is directed to a device for the treatment of automotive exhaust gases comprising a housing having an inlet at one end and an outlet at an opposite end through which exhaust gases flow; a fragile structure resiliently mounted within said housing, said fragile structure having an outer surface and an inlet end surface at one end in communication with said inlet of said housing and an outlet end surface at an opposite end in communication with said outlet end of said housing; a support element disposed between the housing and the fragile structure, said support element comprising an integral, substantially non-expanding ply of melt-formed ceramic fibers comprising about 40 weight percent to about 60 weight percent alumina and about 60 weight percent to about 40 weight percent silica, and a sacrificial binder, wherein said fibers having about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of greater than 200Å to about 500Å; and wherein said support element exerts a minimum residual pressure for holding said fragile structure within said housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000

cycles of testing at 750°C.

The Examiner's Answer of July 5, 2011 (hereinafter referred to as "the Examiner's Answer") alleges that Robinson discloses the claimed apparatus, that is, a device for the treatment of automotive exhaust gases comprising a housing, a fragile structure resiliently mounted within said housing and a support element disposed between the housing and the fragile structure. The Examiner's Answer concedes that Robinson is silent as to the support element being made from ceramic fibers having the physical properties of fibers that are formed according to the claimed time-temperature heating regimen. However, the Examiner's Answer alleges that Myles teaches melt-formed and heat-treated microcrystalline ceramic fibers and that Langer discloses the use of melt-formed ceramic fibers for forming support elements in catalytic converters. According to the Examiner's Answer, it would have been obvious for one skilled in the art to substitute the fibers of Myles for the fibers of the Robinson apparatus to arrive at the claimed subject matter, because melt-formed ceramic fibers were allegedly known to be suitable for forming support elements for catalytic converters, as evidenced by Langer. Appellants respectfully disagree.

In order to establish a prima *facie case* of obviousness under 35 U.S.C. §103(a) there must be (1) a suggestion or motivation to modify a reference, (2) a reasonable expectation of success, and (3) the modification of the reference must teach or suggest all claimed limitations. *In re Vaeck*, 947 F.2d 488 (Fed.Cir. 1991). Appellants respectfully submit that the reasons of record in the Examiner's Answer fail to establish all three elements of a *prima facie* case of obviousness under 35 U.S.C. §103(a). Because the Examiner's Answer fails to establish all elements of a *prima facie* case of obviousness under 35 U.S.C. §103(a), the rejection under 35 U.S.C. §103(a) should be withdrawn.

A. There is no Teaching, Suggestion or Motivation to modify Robinson with the teachings of Myles and Langer.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006); *KSR International Co. v. Teleflex Inc.,* 550 U.S. 398, 82 USPQ2d 1385 (2007) ("When it first established the requirement of demonstrating a teaching, suggestion, or motivation to combine known elements in order to show that the combination is obvious, the Court of Customs and Patent Appeals captured a helpful insight. See *Application of Bergel,* 48 CCPA 1102, 292 F.2d 955, 956-957 (1961)").

An example of an invention which was determined to be non-obvious because the prior art failed to provide any teaching, suggestion, or motivation to combine and modify certain features known in the art is set forth in *United States v. Adams*. The Adams patent was directed to a non-rechargeable electrical battery comprising magnesium and cuprous chloride electrodes placed in a container holding plain or salt water as an electrolyte. The object of Adams was to provide a battery which was able to provide constant voltage and current without the use of acids which were typically used in storage batteries and which did not generate dangerous fumes.

In challenging the validity of the patent, the U.S. government alleged that the Adams patent was obvious in that it was known in the art to substitute magnesium for zinc electrodes and cuprous chloride for silver chloride electrodes and that the Adams battery constituted a mere substitution of these electrodes which were already known in the art. The Supreme Court rejected the government's position,

> Nor is the Government's contention that the electrodes of Adams were mere substitutions of preexisting battery designs supported by the prior art. If the use of magnesium for zinc and cuprous chloride for silver chloride were merely equivalent substitutions, it would follow that the resulting device -- Adams' -- would have equivalent operating characteristics. But it does not. The court below found, and the Government apparently admits, that the Adams battery, 'wholly unexpectedly,' has shown 'certain valuable operating advantages over other batteries,' while those from which it is claimed to have been copied were

> long ago discarded. Moreover, most of the batteries relied upon by the Government were of a completely different type, designed to give intermittent power and characterized by an absence of internal action when not in use. Some provided current at voltages which declined fairly proportionately with time. Others were so-called standard cells which, though producing a constant voltage, were of use principally for calibration or measurement purposes. Such cells cannot be used as sources of power. For these reasons, we find no equivalency. *U.S. v. Adams*, 383 U.S. 39 (1966).

In upholding Adams, the Supreme Court in *KSR International Co. v. Teleflex Inc.,* 550 U.S. 398, 82 USPQ2d 1385 (2007), provided the following in pertinent part:

> As is clear from cases such as *Adams,* a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known. *KSR International Co. v. Teleflex Inc.,* 550 U.S. 398, 82 USPQ2d 1385 (2007).

The fibers of Myles are different from the fibers of Langer. As in *U.S. v. Adams*, merely substituting the melt-formed and heat-treated microcrystalline ceramic fibers of Myles in the exhaust gas treatment device of Robinson in view of the teachings of Langer would not, absent any teaching, suggestion or motivation, lead one of skill in the art to deduce that the combination would have operating characteristics equivalent to that claimed by Appellants.

Appellants respectfully submit that because there is no teaching, suggestion or motivation within or which can be deduced from the cited art in the present case to support a prima facie case of obviousness under 35 U.S.C. §103(a), the rejection under 35 U.S.C. §103(a) should be withdrawn.

Robinson

Robinson does not disclose, suggest, or provide motivation to utilize melt-formed ceramic fibers to prepare a support element for an exhaust gas treatment device. Robinson discloses that suitable fibers for use in preparing a mounting mat include polycrystalline ceramic oxide fibers prepared in accordance with United States Patent No. 4,159,205 and United States Patent No. 4,277,269. These references only teach sol-gel processes for preparing polycrystalline ceramic oxide fibers. The disclosed sol-gel processes involve fiberizing fibers from a solution of dissolved ceramic oxide precursor material.

In contrast to the sol-gel processes of Robinson that involve fiberizing solutions of ceramic oxide precursor materials, the fibers utilized in the support element of Appellants' claims 1, 12 and 47 are for use in a device for treating automotive exhaust gases and are prepared by melt-forming processes. Melt-forming involves the melting of solid ceramic oxide precursor material to form a melt of ingredients and forming fibers by a technique, such as blowing, drawing, or spinning. Unlike sol-gel processes, melt-forming processes do not involve dissolving ceramic oxide precursor materials in a solution and then fiberizing the solution. Robinson discloses advantages to using sol-gel formed fibers and therefore one having skill in the art would not simply disregard the teachings of Robinson and replace these sol-gel fibers with melt-formed fibers.

Myles

Myles supplies no teaching or suggestion whatsoever that its melt-formed fibers are a functionally equivalent to sol-gel fibers, or that the melt-formed fibers could be used to prepare a mounting mat with suitable holding force properties. Myles is directed to refractory ceramic fibers used for insulating high temperature furnaces. See Myles at Col. 1, Lines 10-12. As discussed in further detail below, fibers utilized in exhaust gas treatment devices, such as those disclosed in Robinson, must have the mechanical properties necessary to hold the substrate in position within the housing of the catalytic converter and withstand mechanical impact, vibration and the harsh environments they are exposed to. There is no disclosure in Myles that the furnace insulation was designed to withstand the conditions which fibers of exhaust gas

treatment devices are exposed to. Hence, properties such as the ability to maintain an adequate holding force under the conditions typically encountered during the operation of a motor vehicle are not even addressed or contemplated by Myles. Therefore, Myles provides no teaching, suggestion or motivation that its fibers which are generally used for furnace insulation, are capable of being utilized in exhaust gas treatment devices such as those disclosed in Robinson.

Langer

Langer supplies no teaching, suggestion or motivation whatsoever of utilizing melt-formed fibers having a crystallinity detectable by x-ray diffraction to form a support element for an exhaust gas treatment device. Langer is directed to refractory ceramic fibers which are used to form a heat-insulating mat for a catalytic converter. The fibers of Langer are designed to have a resiliency value of at least 10 kPa so that the heat-insulating mat does not take a compression set that would allow the monolith to become loose after the catalytic converter cools from its normal operating temperature. See Langer at Col. 1, Lines 17-33, Col. 2, Lines 31-45 and Abstract. Langer only teaches that "substantially amorphous" fibers are capable of providing the requisite resiliency value necessary to prevent a metallic monolith from becoming loose after the support mat has been compressed by the thermal expansion of the monolith.

As expressly defined in the specification of the Langer, and emphasized numerous times throughout the prosecution of Langer, the critical feature of Langer is that annealed refractory ceramic fibers of the heat-insulating mat are "substantially amorphous", as that claim term is expressly defined in the Langer.

Langer, defines the term "substantially amorphous" as follows,

> "By 'substantially amorphous' is meant that ***no crystallinity can be detected by x-ray diffraction***, even though microcrystallinity has been detected in some cases by transmission electron microscopy (TEM)." See Langer at Column 2, Lines 61-64. [Emphasis Added].

The definition of the claim term "substantially amorphous" unequivocally states that the refractory ceramic fibers exhibit no crystallinity by x-ray diffraction, ***even though*** microcrystallinity may be detected by transmission electron microscopy. The common dictionary definition of "though" means "notwithstanding that". See Though. (1983). Webster, Noah (Ed.), *Webster's New Universal Unabridged Dictionary* (p. 1900). New York, NY: New World Dictionaries/Simon and Schuster. A common synonym for the word "notwithstanding" is "despite". Thus, Langer's definition of the claim term substantially amorphous could be rewritten as follows: "By 'substantially amorphous' is meant that no crystallinity can be detected by x-ray diffraction, ***despite that*** microcrystallinity has been detected in some cases by transmission electron microscopy (TEM)." It is not controlling or even relevant if microcrystallinity can be detected in the melt-formed refractory ceramic fibers by transmission electron microscopy. Accordingly, fibers that exhibit microcrystallinity by transmission electron microscopy are nonetheless excluded by the definition of "substantially amorphous", if those fibers also exhibit detectable crystallinity by x-ray diffraction.

By being its own lexicographer and including a specific definition for the claim term "substantially amorphous" in the specification, Langer excluded subject matter related to heat-insulating mats that are primarily comprised of refractory ceramic fibers that exhibit detectable crystallinity by x-ray diffraction from its disclosure. Computer Docking Station Corp. v. Dell Inc., Fed. Cir., No. 2007-1169, 3/21/08, quoting Rexnord Corp. v. Laitram Corp., 274 F.3d 1336 (Fed. Cir. 2001). Hence, it cannot now be contended that the specifically defined claim term "substantially amorphous" includes melt-formed refractory ceramic fibers that exhibit crystallinity detectable by x-ray diffraction.

In a response received by the USPTO on March 23, 1993, Langer made the following clear and unequivocal arguments to specifically point out to the Examiner the critical feature of the claims, namely, that the melt-formed and annealed refractory ceramic fibers are "**substantially amorphous":**

> "Applicant . . . has amended claim 1 (as presented in full above for the Examiner's convenience) and 14 to more distinctly point out the **essential feature of the invention**, that the refractory ceramic fibers are **'substantially amorphous,'** and has cancelled claims 2 and 3. The amendments to claims 1 and 15 are supported by the specification at page 4, lines 17-26, and by originally filed claim 3. **Note that the term 'substantially amorphous' is defined on page 4 of the specification to mean that no crystallinity is detectable by x-ray diffraction.** See Exhibit A at Page 3, Lines 7 to 18. [Emphasis Added].

For the precise purpose of distinguishing the fibers of its heat-insulating mat from those fibers described in the cited Johnson reference, Langer made the following remarks in its "Amendment and Response":

- "This reference [Johnson] describes a fine-grained crystalline product produced by heat-treating an amorphous ceramic fibrous material. The fibers are produced by heating the fibers above their devitrification temperature for a selected period of time to produce a devitrified fiber, but the heat treatment is terminated before the onset of excessive grain growth. **The fibers exhibit crystallinity by x-ray diffraction.** (see discussion of figures 2 and 3 on page 2, lines 42-62. . .)" See Exhibit A at Page 3, Line 29 to Page 4, Line 2. [Emphasis Added].

- First, the Examiner's position is apparently taken despite the fact that the primary reference, Johnson et al., . . . **discloses that the fibers exhibit**

> **crystallinity by x-ray diffraction. Thus, the 'fine-grained crystalline product' of Johnson et al. does not have the same size crystals, if any, of the recited fibers in the present claims."** See Exhibit A at Page 5, Line 34 to Page 6, Line 3. [Emphasis Added].

- "Johnson et al. employ in one example a ceramic refractory fiber blanket known under the trade designation 'Kaowool', which has a devitrification temperature of about 950°C according to Johnson et al. This blanket, when heated to 1,000°C for twenty minutes, **produced a fine-grained crystalline structure, evidenced by x-ray examination.** A ceramic refractory fiber blanket known under the trade designation 'Kaowool' may be annealed at the temperatures (700-990°C) recited in claim 4 and used in the devices claimed in the present invention, **but the fibers are substantially amorphous, as explained above."** See Exhibit A at Page 7, Lines 19-29. [Emphasis Added].

- **"Johnson et al. describe refractory fibers having some degree of crystallinity evident by x-ray diffraction, which are different from the annealed fibers used herein**, and do not disclose or suggest the use of their mats in catalytic converters. Thus, the differences between these references and the presently claimed invention are actually quite great and an advance in the art . . ." See Exhibit A at Page 8, Lines 7-14. [Emphasis Added].

The Notice of Allowability mailed on June 2, 1993 for Langer included an Examiner's Statement of Reasons for Allowance. The Examiner specifically stated:

> "[T]he closest prior art of record, namely Johnson et al and Ten Eyck, **fail to teach substantially amorphous ceramic fibers** having a Resiliency Value of at least 10 kPa as set forth in

> Applicant's instant claims 1, 14 and 16 and in the specification. **Both of these references cited supra teach crystalline ceramic fibers** without a teaching of resiliency value." See Exhibit B at Page 2, Line 20 to Page 3, Line 2. [Emphasis Added].

From the Examiner's Statement of Reasons for Allowance, it was the Examiner's understanding from the specification of Langer and arguments made during prosecution in response to the prior art rejection that the Langer invention was limited to heat-insulating mats that were comprised of "substantially amorphous" refractory ceramic fibers having no crystallinity detectable by x-ray diffraction. The Langer disclosure is therefore limited to a heat-insulating mat that primarily comprises melt-formed refractory ceramic fibers that are "substantially amorphous".

Hence, Langer provides no teaching, suggestion or motivation that its fibers have a crystallinity detectable by x-ray diffraction as claimed by Appellants in independent claims 1, 12 and 47. Nor does Langer provide any teaching, suggestion or motivation that melt-formed fibers having a crystallinity detectable by x-ray diffraction could be useful for forming support elements in catalytic converters. Therefore, Langer fails to provide any support to the allegation that the melt-formed crystalline fibers of Myles could be substituted for the fibers of Robinson to yield a predictable result as alleged on page 7 of the Examiner's Answer.

Moreover, Langer discloses ceramic fibers of a fine-grained, amorphous crystalline structure. See Langer at Abstract. Likewise, Johnson discloses melt-formed refractory ceramic fibers that can be annealed to develop a fine-grained crystalline form, of less than 200Å, "while avoiding higher temperatures that would result in a course-grained structure…" See Langer at Col. 1, Line 68 to Col. 2, Line 8 and Johnson at Lines 85-88. Langer discloses annealing fibers below the devitrification temperature of the fiber. See Langer at Col. 2, Lines 56-60. Annealing fibers below the devitrification temperature does not result in the presently claimed crystallite sizes. Unlike Langer and Johnson, Appellants are claiming melt-formed refractory ceramic fibers having a larger grain size. Accordingly, Langer's disclosed ceramic fibers do not suggest that the presently claimed material would be useful or highly relevant in automotive

applications. Rather, Langer teaches melt-formed fibers that remain very fine-grained (as in Johnson) and *substantially amorphous*. See Langer at Col. 2, Lines 56-58. Therefore, although Langer teaches the use of melt-formed ceramic fibers in support elements of catalytic converters, Langer does not provide any teaching or suggestion that melt-formed ceramic fibers having a high degree of crystallinity comparable to that presently claimed may be used in an exhaust gas treatment device. Given that Myles teaches using micro- and macro- crystalline systems of its ceramic fibers in mats for catalytic converters and that Langer only teaches or suggests that melt-formed fibers which are substantially amorphous may be utilized in mounting mats, one of skill in the art would not consider the teachings of Langer in combination with Myles to arrive at the conclusion that the ceramic fibers of Myles may be effectively utilized in the exhaust gas treatment device of Robinson.

The Combination of Robinson, Myles and Langer is based upon Hindsight Reconstruction of Applicant's Claimed Subject Matter.

In view of the above, the only disclosure to use melt-formed and heat-treated ceramic fibers having the presently claimed percent crystallinity and crystallite size within an exhaust gas treatment device comes from Appellants' Specification. In fact, in responding to Appellants' position that Myles does not address holding forces, pages 4 and 5 of the Office Action of October 21, 2009 concedes that the combination of melt-formed and heat-treated fibers comes from Appellants' specification,

> "…This is further evidenced by Applicant's specification, at page 6, lines 12-22, which states that , 'When such fibers are employed, the support mat provides a minimum pressure for holding the fragile catalyst support structure within the housing…" See Office Action of October 21, 2009, Page 5.

It is the present application, and not the cited art, that provides the teaching that melt-formed and heat-treated fibers can be used in a support element for exhaust gas treatment devices and that these fibers possess the requisite crystallinity, crystallite size and holding pressure values. Therefore, the alleged combination of Robinson, Myles and Langer is based on hindsight reconstruction of Appellants claimed subject matter.

The U.S. Supreme Court has stated the following with regard to hindsight, "A fact-finder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." *KSR International Co. v. Teleflex Inc.,* 127 S.Ct. 1727, 1742 (2007). See Also, *Graham v. John Deere Co of Kansas City,* 383 U.S. 1, 36 (1966) (warning against "temptation to read into the prior art the teaching of the invention in issue" and instructing courts to " 'guard against slipping into the use of hindsight' "), quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.,* 332 F.2d 406, 412 (CA6 1964); *In re Fritsch,* 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992)("It is impermissible to use the claimed invention as an instruction manual or a "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious." This court has previously stated that "one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."). Appellants respectfully submit that it is clear that the Examiner's Answer relies on Appellants' present disclosure to reconstruct the claims in the cited art. The combination Robinson, Myles and Langer is based on improper hindsight reasoning and therefore the rejection should be withdrawn.

Myles does not teach an equivalent structure.

It is alleged that the fiber composition of Myles is an equivalent structure. See Examiner's Answer at Page 7. Although structurally similar compositions are presumed to exhibit structurally similar properties (See MPEP §2144.09), this presumption may be rebutted by showing that the claimed composition possesses properties not possessed by those of the prior art or that they possessed them to an unexpectantly greater degree. *In re Dillon*, 919 F.2d 688, 693-694 (Fed. Cir. 1990). In *Ex parte Blattner*, Blattner claimed an azatetracyclic compound useful for treating states of agitation in animals. The Patent Office rejected Blattner's claims based on a structurally similar compound. On Appeal, the Board reversed noting that the compounds of the prior art possessed diametrically opposite utilities in that some of the compounds were used to treat stress and agitation whereas other compounds were used to treat depression. The Board found that this difference undermined the asserted prima facie case for obviousness that structurally similar compounds will have structurally similar properties. The Board further noted that a person of skill in the art who is given only the prior art reference without the benefit of Appellants' disclosure, "would not have had sufficient basis

to predict what , if any, utility Appellants' azepine compounds might possess." *Ex parte Blattner*, 2 USPQ 2d 2047, 2048 (BPAI 1987).

In the case at hand the fiber insulation composition of Myles is directed solely for use as furnace insulation. See Myles at Col. 1, Lines 10-11 and Col. 6, Lines 4-11. Myles provides no indication that its fiber insulation composition is capable of accommodating the mechanical impact, vibration and the harsh environmental conditions which the mounting mat/support element of Robinson and the present application is designed to withstand, or that a mounting mat having the required minimum holding force could be prepared from the fibers. Without the benefit of Appellants' disclosure, a skilled person would not look to Myles to fabricate a mounting mat for automotive exhaust gas treatment devices. Accordingly, Appellants respectfully request that the 35 U.S.C. §103(a) rejection of claims 1, 12 and 47 over Robinson in view of Myles and Langer be withdrawn.

There is no suggestion or motivation to add a sacrificial binder to the fibers of Myles in view of the teachings of Robinson, Myles and Langer.

Appellants assert that to the extent Myles and Robinson are combinable in view of Langer, there would nevertheless be no motivation to add an exogenous binder to the Myles fiber. This is because Myles teaches a fiber that is sufficiently flexible without the addition of a binder,

> A fiber mat or blanket having a density of about 0.05 to about 0.2 grams per cc and a thickness of about 1 to about 10 centimeters manufactured from fibers in accordance with the present invention, can be used at temperatures as high as 1425°C with less than 2 percent linear shrinkage *yet are sufficiently flexible to be applied to furnace walls without an unacceptable amount of cracking or breaking of the fibers or mats*. See Myles at Col. 4, Lines 2-10.

Indeed, a mounting mat requires a high degree of flexibility to be wrapped about the outer circumference of a fragile monolith of an exhaust gas treatment device, which is not required in the furnace application.

According to the Federal Circuit, "A reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect. On the issue of obviousness, the combined teachings of the prior art as a whole must be considered.". *EWP Corp. v. Reliance Universal, Inc.*, 755 F.2d 888, 907(Fed. Cir. 1985) "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241 (CCPA 1965); *see also Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 448-49 (Fed. Cir. 1986). Likewise, in Bausch & Lomb v. Barnes Hind/Hydorcurve, the Federal Circuit held that the district court, ignored portions of a prior art reference that led away from obviousness by failing to consider that reference in its entirety. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 448-49 (Fed. Cir. 1986).

Robinson teaches the application of a binder in mounting mats composed of polycrystalline ceramic oxide fibers prepared from sol-gel processes. The precise reason to add a sacrificial binder to the support element or the mounting mat is to provide flexibility when handling the support element or mounting mat when wrapping it around a fragile catalyst support structure. Myles, on the other hand, discloses that the mat is flexible enough without binder. Consequently, one having ordinary skill in the art would not be lead to add a sacrificial binder to Myles to impart flexibility when Myles expressly teaches adequate flexibility without binder. The Office simply cannot ignore claimed features or dismiss them as routine design changes when the cited art does not indicate the desirability of such features.

According to the Supreme Court in KSR Int'l Co. v. Teleflex Inc., the analysis "to determine whether there was an apparent reason to combine the known elements in the fashion claimed … should be made explicit." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.*, quoting with approval fro *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Based on the remarks set forth above, Appellants respectfully

submit that the Office has failed to provide any reason or rational as to why a person of ordinary skill in the art would individually look to the teachings of Robinson, Myles and Langer and combine them to arrive at Appellants claimed subject matter recited in independent claims 1, 12 and 47. Accordingly, Appellants respectfully request that the 35 U.S.C. §103(a) rejection of claims 1, 12 and 47 be withdrawn.

B. There is no reasonable expectation of success based on the combination of Robinson, Myles and Langer.

Evidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness. *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). Whether an art is predictable or whether the proposed modification or combination of the prior art has a reasonable expectation of success is determined at the time the invention was made. *Ex parte Erlich*, 3 USPQ2d 1011 (Bd. Pat. App. & Inter. 1986).

For the combination of Myles, Robinson and Langer to have been obvious at the time of the invention, a person of ordinary skill in the art would have needed some reason upon which to base an expectation of success. A reasonable expectation does not exist in this case. Myles is directed to a refractory fiber for use as furnace insulation. A furnace is a static structure that is commonly used in a controlled environment. Myles does not teach that the fiber disclosed is useful in any application other than furnaces, or that the fiber might be used in mechanically demanding environments, such as in automotive exhaust gas treatment devices. Therefore, there is no reasonable basis upon which to base a prediction that use of the Myles fibers in exhaust gas treatment devices would succeed.

Additionally, Myles does not disclose that the fibers have the mechanical properties needed during normal operation in the environments described in Robinson, namely, catalytic converters and diesel particulate traps. The environments described in Robinson are far more mechanically demanding environments than are furnaces, as the Robinson devices are commonly subject to mechanical impact, vibration, multi-axial loading, and fatigue that would be extremely unusual for furnaces. Accordingly, a person of ordinary skill in the art would not

have reason to automatically assume that the fibers of Myles can withstand more demanding mechanical conditions than those for which they were designed or intended.

For example, the dynamic forces to which the devices of Robinson are subjected act intermittently and fluctuate, create many load cycles, and can theoretically induce high-cycle or even very high-cycle fatigue conditions. Engine vibrations from an engine averaging 3000 revolutions per minute at highway speeds of 60 miles per hour over 60,000 miles will induce 180 million (180,000,000) cycles in the vehicle catalytic converter. 180 million loading cycles is very high-cycle fatigue. Appellants contend that no furnace loading pattern could be anticipated to produce such very high-cycle fatigue. One having ordinary skill in the art would have no reason to assume that furnaces or materials for use in furnaces would withstand very high-cycle fatigue loading of such magnitude.

Furthermore, the fibers described in Myles, for use in a furnace, would not need to withstand and could not be predicted to withstand the rate of temperature change or the frequency of temperature change of the devices described in Robinson. At the time of the invention, a person of ordinary skill in the art would have no basis upon which to predict that the fibers described in Myles could successfully withstand the different thermal demands of the devices described in Robinson. Therefore, a person of ordinary skill in the art could not reasonably expect that the fibers of Myles would be capable of adequately functioning as a support element within a device for the treatment of exhaust gases as claimed.

Myles is directed to insulation materials in a static environment, i.e., furnace insulation applications, and *does not address holding forces.* Therefore, it is not predictable that a melt-formed blanket of Myles would have the adequate holding force necessary for use in an exhaust gas treatment device as described in Robinson when Myles does not even address holding force issues and the fiber of the Robinson mat is of a different material (i.e., sol-gel fibers). The Examiner's Answer cites to Langer as evidence that melt-formed fibers of the type disclosed in Myles could be capable of use in an exhaust gas treatment device as described in Robinson. Langer, however, is directed solely to amorphous fibers which are defined by Langer as fibers having no crystallinity which can be detected by x-ray diffraction. See Langer at Col. 2, Lines

61-64. The fibers of Myles, however, are crystalline in nature. See Myles at Col. 1, Lines 50-60. Therefore, it cannot be presumed, based on the teachings of Langer, that a person of ordinary skill in the art would have a reasonable expectation of success that the fibers of Myles would possess all the necessary properties described above for successfully functioning within an exhaust gas treatment device, based on the teaching of substantially amorphous fibers of Langer.

For the aforementioned reasons, there can have been no reasonable expectation of success in combining Myles and Robinson in view of Langer at the time the invention was made. Therefore, the combination of Robinson, Myles and Langer cannot properly support an obviousness rejection. Appellants respectfully request that the 35 U.S.C. §103(a) rejection of claims 1, 12 and 47 be withdrawn

C. The combination of Robinson, Myles and Langer does not teach or suggest all of the claimed features.

The combination of Robinson, Myles and Langer does not arrive at the presently claimed subject matter because this combination of references does not teach or suggest all of the claimed features, that is, even if Robinson were combined with Myles and Langer as proposed, the resultant combination would still fall short of yielding the claimed subject matter and would still fail to satisfy all the claimed features.

As mentioned above, the Examiner's Answer bases its allegation of obviousness on modifying Robinson by substituting the fibers of Myles for the fibers of the Robinson apparatus. The motivation for substituting the fibers of Myles for the fibers of Robinson is allegedly provided by Langer, which is alleged to teach the use of melt-formed fibers in exhaust gas treatment devices. This rationale, known as substituting one known element for another, applies when one of ordinary skill in the art is technologically capable of making the substitution and the result obtained from the substitution would have been predictable to one of ordinary skill in the art. See MPEP §2143B. In the case at hand, neither the teachings of Robinson, nor the teachings of Myles, nor the teachings of Langer provide any indication whatsoever that the claimed combination of physical properties for crystallinity, crystallite size

and holding pressure can be obtained by substituting the fibers of Myles for the fibers of the Robinson apparatus. In essence, because the combination of Robinson, Myles and Langer fails to provide any teaching or suggestion of a ply of melt-formed ceramic fibers having the claimed physical properties for crystallinity, crystallite size and holding pressure, it would not have been predictable to one of ordinary skill in the art to substitute the fibers of Robinson with the fibers of Myles in view of the teachings of Langer in order to arrive at the claimed values for crystallinity and crystallite size. Without the claimed crystallinity and crystallite size, there is no expectation that the fibers would provide a mat with sufficient holding pressure.

The Examiner's Answer identifies certain features of the claimed exhaust gas treatment device, which are allegedly disclosed by Robinson, but the Answer expressly and unequivocally concedes that Robinson ***does not*** disclose or suggest an exhaust gas treatment device mounting mat (more broadly known as a support element) containing ceramic fibers having the physical properties of fibers that are formed according to the claimed time-temperature heating regimen. See Examiner's Answer at Page 6. Furthermore, Robinson does not provide any suggestion or motivation to treat the ceramic fibers (for example, by heat treating) to provide such crystallinity and crystallite size. In fact, heat treating the fibers in the manner presented in claims 1, 12 and 47 is not even contemplated or suggested by Robinson.

Robinson discloses that suitable polycrystalline oxide ceramic fibers and methods of producing the same are found in U.S. Patent Nos. 4,159,205 (Miyahara et al., hereinafter referred to as "Miyahara") and 4,277,269 (Sweeting) which are both incorporated by reference by Robinson. See Robinson at Col. 5, Lines 59-62. The ceramic fibers of Miyahara and Sweeting, however, are not melt-formed as those presently claimed, but rather, are prepared from a solvent solution in a sol-gel process. The disclosed sol-gel processes of Miyahara and Sweeting involve fiberizing fibers from a solution of dissolved ceramic oxide precursor material. The fiberization process of Miyahara and Sweeting comprises spinning a solution of ceramic oxide precursor and heating the fibers in an oxygen atmosphere to form ceramic oxide fibers. See Miyahara at Col. 2, Lines 4-42 and Sweeting at Col. 2, Lines 10-40. Thus, heat is used in Miyahara and Sweeting as a catalyst to form ceramic oxide fibers from the ceramic oxide precursor and not as a separate treatment to ceramic oxide fibers which have already been

formed. Accordingly, Miyahara and Sweeting do not provide any teaching or suggestion of using a post-fiberization heat treatment to crystallize the fibers. Hence, the fibers of Robinson are not heat treated to have a crystallite size of greater than 200Å to about 500Å as recited in claims 1, 12 and 47, and Robinson provides no suggestion or motivation for forming fibers having such crystallinity. Because the product of Robinson does not disclose the claimed features of melt-formed ceramic fibers having the claimed percent crystallinity and crystallite size, the product of the instant claims 1, 12 and 47 is not substantially the same as the product of Robinson.

Furthermore, as mentioned above, Myles is directed to furnace insulation in a static environment. Consequently, Myles does not address holding forces, nor does it provide any suggestion or motivation that its fibers are capable of providing the minimal holding force required for holding a fragile structure within a housing of an exhaust gas treatment device.

Langer is directed to a heat-insulating mat for a catalytic converter having a resiliency value which prevents a metallic monolith from becoming loose after the heat-insulating mat has been compressed by the thermal expansion of a metallic monolith within a canister of a catalytic converter. See Langer at Col. 2, Lines 32-45. Langer, however, as mentioned above, is solely directed to a heat-insulating mat of substantially amorphous fibers. Langer fails to provide any teaching, suggestion or motivation that fibers having a crystalline nature such as those disclosed in Myles are capable of possessing an adequate resiliency value for holding a metallic monolith within the housing of an exhaust gas treatment device. In fact, Langer teaches the exact opposite in the following passage,

> "The melt-formed refractory ceramic fibers of the heat-insulating mat can be annealed to develop a fine-grained crystalline form (as in the Johnson UK Pat. Spec.) while avoiding higher temperatures that would result in a coarse-grained structure and consequently resulting an unsatisfactory Resiliency Value." See Langer at Col. 2, Lines 51-56.

Accordingly, one reading Langer must look to the teachings of the Johnson UK Pat. Spec. (U.K. Patent No. 1,481,133, hereinafter referred to as Johnson), to realize the meaning of a fine-grained crystalline form. In this regard, Johnson teaches that X-ray examinations indicate that the average crystalline size in fine-grained alumina-silica fiber is less than 200 angstroms (Å) (which is equivalent to less than 0.02 microns). See Johnson at Page 2, Lines 85-88.

Myles, on the other hand, is directed to a ceramic fiber comprising a microcrystalline combination of alumina and silica. "Microcrystalline" is defined by Myles as, "a crystalline structure having numerous crystals, i.e., microcrystals, with an average size of less than about 5 percent of the fiber diameter and desirably less than 0.1 microns." See Myles at Col. 2, Lines 10-17. Myles also discloses that the preferred range of fiber diameter is between about 0.5 and about 25 microns, and for better thermal resistivity, from about 1 to about 5 microns. See Myles at Col. 2, Lines 50-53. Thus, Myles is directed to ceramic fibers having a crystallinity from about 0.025 microns (5% of a 0.5 micron fiber diameter) to about 1.25 microns (5% of a 25 micron fiber), preferably from about 0.05 microns (5% of a 1 micron fiber diameter) to about 0.25 microns (5% of a 5 micron fiber diameter). Such fibers are considered to have a coarse-grained structure according to the teachings of Langer and Johnson in that they have a crystallite structure of 0.02 or greater and would therefore, result an unsatisfactory resiliency value or holding force.

Thus, Langer and Myles clearly teach away from one another. The Federal Circuit in *Syntex (U.S.A.) LLC v. Apotex, Inc.*, recited the following as the proper standard for teaching away:

> …a reference will teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the applicant's invention. A statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination. *Syntex (U.S.A.) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005).

In the present case, Langer unequivocally teaches that fibers having a coarse-grained structure such as those disclosed in Myles, would possess an unsatisfactory resiliency value. Therefore, Langer fails to provide any support whatsoever to the contention that the fibers of Myles would have exhibit the minimum residual pressure for holding the fragile structure within the housing of the device for the treatment of exhaust gases as recited in independent claims 1, 12 and 47.

Therefore, even if the fibers of Robinson were substituted with the fibers of Myles, Langer teaches that the resultant combination would still fail to teach the minimum residual pressure, as recited in claims 1, 12 and 47, for holding the fragile structure within the housing. Regardless of whether or not it can be said that the claimed fiber composition is structurally similar to the combination of Robinson with Myles in view of Langer, the Federal Circuit has held that it is permissible to show that similar compounds possess unexpected properties to demonstrate nonobviousness,

> [P]atentability for a chemical compound does not depend only on structural similarity. ...This court will not ignore a relevant property of a compound in the obviousness calculus. …When claimed properties differ from the prior art, those differences, if unexpected and significant, may lead to nonobviousness....One of ordinary skill in the art cannot simply take various components and combine them without a commonality of purpose or characteristics that gives the artisan some reasonable expectation of success. *Eli Lilly & Co. v. Zenith Goldline Pharmaceuticals, Inc.*, 471 F.3d 1369, 1378 (Fed. Cir. 2006).

Therefore, based on the teachings of the cited art, Appellants respectfully submit that it is not predictable that a melt-formed blanket of Myles would have the adequate holding force necessary for the Robinson device when Myles does not even address holding force issues, the fiber of the Robinson mat is of a different material (i.e., sol-gel fibers) and Langer teaches that fibers of the type disclosed in Myles would result in an unsatisfactory resiliency value.

Appellants' claimed values for crystallinity, crystallite size and holding pressure are not inherent or obvious in view of Myles.

The Examiner's Answer alleges that the presently claimed crystallinity and crystallite size would be inherent, claiming that because the time-temperature regimen as taught by Myles is identical to or substantially identical to Appellants' claimed time-temperature regimen, a support element comprising the heat treated ceramic fibers of Myles would be identical to the instantly claimed ceramic fibers and have a crystallinity of from about 5 to 50 percent and a crystallite size of greater than 200Å to about 500Å. Appellants deny that the claimed values for percent crystallinity of the currently claimed support element is inherent in the Myles teaching. The combination of the claimed values for crystallinity and crystallite size were not known or readily extrapolated from the teachings of the cited art at the time Appellants developed the claimed subject matter.

In the present case, neither Robinson nor Myles provide any teaching or suggestion of a relationship between crystallinity and crystallite size and holding pressure performance of a support mat. Langer teaches that fibers having a fine-grained crystalline form possess a satisfactory resiliency value whereas higher crystalline melt-formed ceramic heat-insulating mats (i.e., heat-insulating mats having a coarse grain structure) can result in an unsatisfactory resiliency value. See Langer at Col. 2, Lines 51-56. As mentioned above, Langer refers to Johnson to define the term "fine-grained". According to Johnson, the term "fine-grained" is defined as an alumina-silica fiber having a crystallinity of less than 200 angstroms (Å). Accordingly, it reasons that the term "coarse grain structure" according to Langer means a fiber having a crystallinity of 200 angstroms (Å) or greater. Independent claims 1, 12 and 47 of the present application recite a crystallite size of greater than 200 Å to about 500 Å, which according to Langer is considered to be a fiber having a coarse-grained structure and undesirable because such a fiber could have an unsatisfactory resiliency value. Therefore, the fact that Appellants have discovered a crystalline support element having an acceptable holding pressure renders Appellants' claimed subject matter unexpected. "[Inherency] is quite immaterial if … one of ordinary skill in the art would not appreciate or recognize the inherent result." *In re Rijckaert*, 9 F.3d 1531, 1533 (Fed. Cir. 1993).

Moreover, without acquiescing to the Examiner's position, Appellants submit "that which is inherent in the prior art, if not known at the time of the invention, cannot form a proper basis for rejecting the claimed invention as obvious under §103." See *In re Shetty*, 566 F.2d 81, 86, 195 USPQ 753, 756-57 (CCPA 1977). Obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). Notwithstanding the teaching of Myles with regard to crystallinity, crystallite size, flexibility and shrink resistance, because none of the cited references teaches or suggests a material having the claimed values for crystallinity and crystallite size that could be formed into a mounting mat for an exhaust gas treatment device, the references do not provide all of the limitations of the claims and therefore do not establish a *prima facie* case of obviousness.

Crystallinity and crystallite size would not have been considered a result effective variable by one of ordinary skill in the art.

The Examiner's Answer also alleges that the crystallinity and crystallite size would have been considered a result effective variable by one of ordinary skill in the art in view of Myles which teaches general time and temperature parameters for producing a crystalline ceramic fiber and that the discovery of optimum or workable ranges involves only routine skill in the art. See Examiner's Answer at Page 8 and Myles at Col. 3, Lines 21-58. Appellants respectfully traverse.

In response, Appellants respectfully submit that claims 1, 12 and 47 also recite that the support element exerts a minimum residual pressure for holding the fragile structure within the housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C. Therefore, assuming this premise to be true, one of ordinary skill in the art with knowledge of Myles at the time of the present invention, would also have to discover the optimum or workable ranges for a support element having the claimed values for holding pressure in addition to crystallinity and crystallite size. Considering that Myles is

directed solely to furnace insulation wherein holding pressure is not an issue and that Myles provides no teaching or suggestion whatsoever of obtaining a fiber having a particular holding pressure, Appellants respectfully submit that such modifications to Myles would be beyond what would be considered to be routine skill in the art of furnace insulation. Where the prior art has not recognized the "result-effective" capability of a particular invention parameter, no expectation would exist that optimizing the parameter would successfully yield the desired improvement. *In re Antonie*, 559 F.2d 618, 619 (CCPA 1977). Based on the remarks set forth above, Appellants respectfully request that the 35 U.S.C. §103(a) rejection of independent claims 1, 12 and 47 be withdrawn.

Claims 2, 5, 6, 10, 11, 13, 16, 17, 26, 27, 48, 49, 50, 54 and 55

Claims 2, 13 and 48 were rejected in view of Robinson for the reasons set forth on page 8 of the Examiner's Answer. Claims 5, 6, 16, 17, 49 and 50 were rejected in view of Myles and claims 10, 11, 26, 27, 54 and 55 were rejected in view of Robinson for the reasons set forth on page 9 of the Examiner's Answer.

Appellants have addressed the instant rejections presented in the Examiner's Answer with respect to independent claims 1, 12 and 47 in particular, and have distinguished the applied references as discussed above. It is therefore deemed unnecessary to address the specific allegations regarding the dependent claims. Appellants, therefore, traverse these allegations, and do not concur with the same either explicitly or implicitly by not refuting each individually.

Appellants respectfully submit that because independent claims 1, 12 and 47 are not taught or suggested by any combination of Robinson, Myles and Langer, claims 2, 5, 6, 10 and 11, which depend from and include the features of claim 1; claims 13, 16, 17, 26 and 27, which depend from and include the features of claim 12; and claims 48, 49, 50, 54 and 55, which depend from claim 47 are also not taught or suggested by any combination of Robinson, Myles and Langer. *See In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988). ("If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is

nonobvious." MPEP§2143.03 at page 2100-142.) Accordingly, Appellants respectfully request that the rejection of claims 2, 5, 6, 10, 11, 13, 16, 17, 26, 27, 48, 49, 50, 54 and 55 as recited in pages 8-9 of the Examiner's Answer be withdrawn.

II. Rejection Under 35 U.S.C. §103(a) of Claims 7, 18, 41-44 and 51

Claims 7, 18, 41-44 and 51 are rejected as allegedly unpatentable over Robinson et al. (U.S. Patent No. 5,580,532) in view of Myles (U.S. Patent No. 4,240,833) and further in view of Sasaki et al. (JP 07-286514) under 35 U.S.C. §103(a) as applied to claims 1, 9, 12 and 21. Appellants respectfully traverse. An English language translation of Sasaki is provided with this response (See Exhibit A).

Appellants traversing arguments presented above with respect to the improper combination of Robinson and Myles are not repeated, but are incorporated herein by reference against the rejection of claims 7, 18, 41-44 and 51. Furthermore, Sasaki teaches away from the combination with Myles. Because Sasaki and Myles teach away from one another, the combination of Myles and Sasaki would not suggest to one of ordinary skill in the art a reasonable expectation of success. Evidence showing there is no reasonable expectation of success may support a conclusion of nonobviousness. *In re Rinehart*, 531 F.2d 1048 (CCPA 1976).

Claims 7, 18 and 51 recite that the fibers of the support element have less than about 10% shot while claims 41-44 recite that the support element or the mat is needled.

With regard to claims 7, 18 and 51, the Examiner's Answer alleges that column 5, line 65 to column 6, line 1 of Robinson teaches that the ceramic fibers should be shot free, e.g., on the order of about 5 percent nominally or less. The Examiner's Answer further alleges that paragraph [0007] of Sasaki teaches a ceramic fiber having a shot content of 5% or less and that it would have been allegedly obvious to create a ceramic fiber having less than about 10% shot because Sasaki teaches that when larger amounts of shot are present in the ceramic fiber, the specific gravity of portions of the support element/mat increases, and thermal conductivity becomes uneven, resulting in an inability to evenly hold the fragile structure. With regard to

claims 41-44, the Examiner's Answer alleges that paragraphs [0008] and [0009] of Sasaki teach that needling orients some of the ceramic fibers in a vertical direction to tightly bind the support element or mounting mat such that the bulk density of the support element or mounting mat is increased and separation or shifting of the layers of the support element or mounting mat can be prevented. Appellants respectfully traverse.

Sasaki discloses a "holder" for exhaust gas purifying devices. The holder is comprised of alumina fibers. The composition of the alumina fibers of Sasaki is strictly limited to fiber compositions having a weight ratio of Al_2O_3:SiO_2 of 70:30 – 74:26. See Sasaki at Abstract (Pages 1 and 2); Claim 1; and Page 4, Lines 3-7. In fact, Sasaki expressly teaches that when the Al_2O_3:SiO_2 ratio is not in the range of 70:30 – 74:26, fiber deterioration occurs prematurely and the fibers do not withstand long usage. See Sasaki at Page 4, Lines 4-7. Sasaki also teaches that when the alumina to silica ratio is not within the above-described range, fiber deterioration caused by crystallization and crystal growth at high temperatures occurs prematurely and it does not withstand long usage. See Sasaki at Paragraph [0005].

Myles, on the other hand, teaches fibers which are manufactured from a melt containing about 40 to about 65 weight percent alumina and from about 35 to about 60 weight percent silica. See Myles at Col. 2, Lines 36-40. Since the range of weight percent of alumina taught by Sasaki is 70 to 74, and since the range of weight percent of alumina taught by Myles is 40 to 65, the respective ranges of alumina are mutually exclusive. Since the range of weight percent of silica taught by Sasaki is 26 to 30, and since the range of weight percent of silica taught by Myles is 35 to 60, the respective ranges of silica are mutually exclusive.

Sasaki and Myles clearly teach away from one another. The Federal Circuit in *Syntex (U.S.A.) LLC v. Apotex, Inc.*, recited the following as the proper standard for teaching away:

> …a reference will teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the applicant's invention. A statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination. *Syntex (U.S.A.) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005).

In this regard, Sasaki teaches that the fiber must be a mullite composition having a weight ratio of alumina to silica of "70/30 ~ 74/26". See Sasaki at Paragraph 5. Sasaki also teaches that when the alumina to silica ratio is not in the above-described range, fiber deterioration caused by crystallization and crystal growth at high temperatures occurs prematurely and it does not withstand long usage. See Sasaki at Paragraph [0005]. Thus, Sasaki clearly discourages the manufacture of a fiber outside its disclosed ratio of alumina to silica. Myles, however, teaches fibers which are manufactured from a melt containing about 40 to about 65 weight percent alumina and from about 35 to about 60 weight percent silica See Myles at Col. 2, Lines 36-40. Given that the range of weight percent of alumina taught by Sasaki is 70 to 74, and given that the range of weight percent of alumina taught by Myles is 40 to 65, the respective ranges of alumina are mutually exclusive. Also, given that the range of weight percent of silica taught by Sasaki is 26 to 30, and given that the range of weight percent of silica taught by Myles is 35 to 60, the respective ranges of silica are mutually exclusive. Myles teaches a fiber comprising a ratio of alumina to silica which is outside the range taught by Sasaki. Sasaki teaches away from the manufacture of the Myles fibers (those outside the range of the ratio of alumina to silica taught by Sasaki) because such fibers would deteriorate due to high crystallization and would not withstand long usage. Thus, no proper obviousness rejection can be made based upon a combination which includes a combination of Sasaki and Myles.

Furthermore, it is impermissible within the framework of 35 U.S.C. §103 to pick and choose from any single reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. *Lubrizol Corp. v. Exxon Corp.,* 896 F. Supp. 302, 322, 7 USPQ2d 1513, 1527 (N.D. Ohio 1988) ("It is not permissible to pick and choose only so much of any given reference as will support a given position and ignore the reference in its totality."). In *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.,* the Federal Circuit held that a single line in a prior art reference should not be taken out of context and relied upon with the benefit of hindsight to show obviousness. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.* 796 F.2d 443, 230 USPQ 416 (Fed. Cir. 1986), *cert. denied,* 484 U.S. 823 (1987). Rather, a reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. The Examiner's Answer simply ignores all of the

teachings in Sasaki about fiber composition that would lead one having ordinary skill in the art away from combination with Robinson and Myles, but impermissibly picks and chooses a couple of teachings about shot content and needling to support the rejection. It is not proper to ignore the teachings of Sasaki which would teach against combination with Robinson and Myles and select tangential teachings about shot and needling to support the rejection. Moreover, given the differences in fiber chemistry between Myles and Sasaki, there is no expectation that the teachings about shot content and needling would apply to the fiber compositions of Myles. This is simply conjecture on the part of the Office. In view of the improper combination of Sasaki with Robinson and Myles, Appellants request that the rejection of claims 7, 18, 41-44 and 51 as allegedly unpatentable over Robinson in view of Myles and further in view of Sasaki under 35 U.S.C. §103(a) as applied to claims 1, 9, 12 and 21 be withdrawn.

III. Response to Examiner's Position regarding Applicant's Arguments Presented on Appeal

The Examiner's Answer alleges that the disclosed examples of ceramic fibers produced according to "sol-gel" processes in U.S. Patent Nos. 4,159,205 and 4,277,269 cited in Robinson are merely exemplary and that and that based on the broader disclosure, one of skill in the art could have selected other known ceramic fibers. The Examiner's Answer also alleges that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments.

In response, Appellants respectfully submit that col. 5, lines 58-64 of Robinson explicitly states, "Suitable polycrystalline oxide refractory ceramic fibers and methods for producing the same are contained in U.S. Pat. Nos. 4,159,205 and 4,277,269…". No other suitable examples of refractory ceramic fibers are disclosed by Robinson. Moreover, Appellants position is that Robinson does not provide any teaching, suggestion or motivation of using melt-formed fibers, not that Robinson's teaching of sol-gelled fibers teaches away from using melt-formed fibers.

The Examiner's Answer alleges that Langer teaches a catalytic converter support element formed from melt-formed fibers and that one of ordinary skill in the art would have therefore considered melt-formed ceramic fibers of Myles to be a suitable alternative to sol-gel fibers. The Examiner's Answer also cites to Langer addressing the prior art of Johnson et al. (UK Pat. Spec. No. 1,481,133) which teaches melt-formed ceramic fibers for use in furnace applications. Langer, however, is directed to ceramic fibers which are "substantially amorphous". Langer provides no teaching, suggestion or motivation that melt-formed ceramic fibers having a crystalline structure are capable of being used as a support element for an exhaust gas treatment device. Moreover, Langer teaches that melt-formed ceramic fibers having a crystallinity such as that claimed by Appellants would result in an unsatisfactory resiliency value for holding a metallic monolith within the housing of an exhaust gas treatment device. See Langer at Col. 2, Lines 51-56 and Johnson at Page 2, Lines 85-88.

The Examiner's Answer alleges that Langer was merely relied upon to evidence that the use of melt-formed ceramic fibers for forming support elements in catalytic converters was known. However, as discussed above, Langer teaches that not all types of melt-formed ceramic fibers are capable of operably functioning in an exhaust gas treatment device, i.e., fibers having a relatively higher degree of crystallinity than that disclosed in Langer fail to provide an acceptable resiliency value. "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241 (CCPA 1965).

The Examiner's Answer disputes Appellants' position that the Office's conclusion of obviousness is based upon improper hindsight reasoning. Specifically, the Examiner's Answer states that all judgments on obviousness are in a sense reconstructions based on hindsight reasoning and that the difference between a proper and improper hindsight reconstruction is that a proper reconstruction takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from Appellants' disclosure. In this regard, the Examiner's Answer states that it would have been obvious for one of ordinary skill in the art to substitute the heat treated, melt-

formed ceramic fibers of Myles for the ceramic fibers in the support element of Robinson because the fibers of Myles allegedly retain sufficient flexibility and exhibit low shrinkage and because Langer allegedly teaches the use of melt-formed ceramic fibers for forming support elements in catalytic converters. Appellants respectfully submit, however, that neither Robinson, Myles, nor Langer teach melt-formed and heat-treated fibers comprising the claimed values for crystallinity, crystallite size and holding pressure performance which can be used to form a support element for exhaust gas treatment devices. These features can only be taken from Appellants' specification. Appellants respectfully submit that the Office Action of October 21, 2009 supports Appellants' position on this matter in that it cites to page 6, lnes 12-22 of the Specification which states, "When such fibers are employed, the support mat provides a minimum pressure for holding the fragile catalyst support structure within the housing…".

The Examiner's Answer alleges that the citation on page 6, lines 12-22 of Appellants' Specification was used to show that a ceramic fiber produced according to Appellants process, similarly taught by Myles, will inherently exhibit the recited holding pressure and that the recognition of latent properties in the prior art does not render nonobvious an otherwise known invention. Without acquiescing to the Examiner's position with regard to inherency, Appellants submit "that which is inherent in the prior art, if not known at the time of the invention, cannot form a proper basis for rejecting the claimed invention as obvious under §103." See *In re Shetty*, 566 F.2d 81, 86, 195 USPQ 753, 756-57 (CCPA 1977). Obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re rijckaert*, 9 F.2d 1531, 28 USPQ 2d 1955 (Fed. Cir. 1993). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Oelrich*, 666 F.2d 578-581-82, 212 USPQ 323, 326 (CCPA 1981).

Moreover, Appellants respectfully submit that the Examiner's Answer has misconstrued the phrase "when such fibers are employed" to mean that furnace insulation materials are equivalent to support elements for an exhaust gas treatment device. Page 6, lines 12-22 of the Specification states:

> "When such fibers are employed, the support mat provides a minimum pressure for holding the fragile catalyst support structure within the housing of at least one of i) at least 4 psi after at least 200 cycles and/or after 1000°C of testing at 900°C or ii) at least about 10 psi after at least 1000 cycles of testing at 750°C.
>
> Summary of the Invention
>
> It is an object of the present invention to provide a device for the treatment of exhaust gases which includes a support element possessing improved holding pressure characteristics."

Nowhere within the Specification do Appellants equate furnace insulation materials as equivalent to support elements for exhaust gas treatment devices. In fact, page 5, line 27 to page 6, line 3 of the Specification states that there was no prior art teaching that insulation materials for furnace liners were suitable for use as mounting mats for catalytic converters. Thus, the Examiner's Answer has improperly read Appellants' disclosure into the prior art. "It is impermissible to use the claimed invention as an instruction manual or a "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritsch*, 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992).

The Examiner's Answer alleges that the intended use for fiber blankets or mats as furnace insulation according to Myles is merely exemplary and that other uses are envisioned by Myles. Myles, however, fails to provide any teaching or suggestion that its ceramic fibers are enabled for use in any other application other than furnace insulation. "To 'anticipate,' the identical subject matter must not only be previously known, but the knowledge must be sufficiently enabling to place the information in possession of the public." *In re Omeprazole Patent Litigation*, 483 F.3d 1364, 1378 (Fed. Cir. 2007).

The Examiner's Answer cites to column 3, lines 40-49 and column 2, lines 38-61 of Robinson as teaching the following characteristics which enable a mounting mat to operate successfully in a catalytic converter: i) good handleability and fabrication characteristics; ii) the

capability to withstand high temperatures without degradation while maintaining stable pressure over a wide range of operating temperatures; and iii) flexibility without the need of additional means to maintain structural integrity. The Examiner's Answer further states that the ceramic fibers of Myles possess the required characteristics in order to enable their use within a catalytic converter in that the fibers are in the form of a mat or blanket which can be bent in an arc without cracking, that the fibers are able to withstand high temperatures without degradation, and that fibers exhibit minimal shrinkage. Myles, however, fails to provide any teaching or suggestion that its fibers possess the requisite minimum residual pressure for holding a fragile structure within the housing of a catalytic converter over frequent and wide fluctuations in temperature in addition to the mechanical impacts typically encountered under normal operating conditions of the exhaust gas treatment device. This feature is disclosed in Robinson as one of the features which enable a mounting mat to operate successfully in a catalytic converter and is acknowledged as such on page 17 last paragraph to page 18 first paragraph of the Examiner's Answer which is quoted above. Accordingly, Myles fails to provide that its fibers are capable of being used within an exhaust gas treatment device.

The Examiner's Answer alleges that although the fibers of Myles may be sufficiently flexible without the application of a binder, it would have been obvious for one of ordinary skill in the art at the time the invention was made to include a binder in order to further facilitate the formation of the ceramic fibers into the mat structure in view of Robinson and that Langer teaches application of a sacrificial binder to make the fiber mat easier to handle. In response, Appellants respectfully submit that the fibers of Robinson are directed to polycrystalline ceramic oxide fibers made from sol-gel processes whereas the fibers of Langer are directed to substantially amorphous refractory ceramic fibers. Both the fibers of Robinson and Langer are designed for use in exhaust gas treatment devices. The refractory ceramic fibers of Myles, however, differ from those of Robinson and Langer in that they are directed to melt-formed crystalline ceramic fibers which are designed for use in insulating high temperature furnaces. Thus, the fibers of Robinson, Myles and Langer are each of a different type and use. Given these differences in the fibers of Robinson, Myles and Langer, Appellants respectfully submit that it does not necessarily follow that the application of binder the fibers of Myles would result in an improving the properties of the Myles fibers to further facilitate the

formation of Myles fibers into a mat structure. In fact, given that Myles teaches that its fibers are sufficiently flexible without a binder, Application of a binder to the Myles fibers may, in fact, hinder the ability of the Myles fibers to operably function. Therefore, Appellants respectfully submit that position stated in the Examiner's Answer on this matter is mere conjecture. Moreover, "It is not permissible to pick and choose only so much of any given reference as will support a given position and ignore the reference in its totality." *Lubrizol Corp. v. Exxon Corp.*, 896 F. Supp. 302, 322, 7 USPQ 2d 1513, 1527 (N.D. Ohio 1988). To do so would ignore the fact that Myles teaches that its fibers are sufficiently flexible without the addition of a binder.

The Examiner's Answer alleges that the ceramic fibers of Myles are subjected to the same heat treatment claimed by Applicant and that it would appear that a support element formed from the ceramic fibers of Myles would exhibit the claimed holding pressure without experiencing a permanent compression set. Myles, however, provides no teaching, suggestion or motivation that heat treating its ceramic fibers would result in an increase in holding pressure of the insulation blanket or mat. Nor is there a need for Myles to provide for an insulation blanket or mat having a high holding pressure as is typically needed in automotive exhaust gas treatment devices as Myles is directed to insulation materials for furnace applications. Thus, Myles provides no suggestion or motivation for further optimizing the time-temperature regimen for heat treating the fibers to obtain the claimed values for crystallinity and crystallite size in addition to holding force.

The Examiner's Answer alleges that the "holding forces" or "minimum residual pressure for holding said fragile structure within said housing" as recited in the claims would be an inherent or latent property of a support element formed from a ceramic fiber produced from the process set forth in the claims. The Examiner's Answer also cites to page 6, lines 12-22 of Appellants' Specification as evidence of the alleged inherency of "holding forces" or "minimum residual pressure". Appellants respectfully submit that the Examiner's Answer has misconstrued the phrase "when such fibers are employed", as explained above, and has improperly read Appellants' disclosure into the prior art. "It is impermissible to use the claimed invention as an instruction manual or a "template" to piece together the teachings of

the prior art so that the claimed invention is rendered obvious." *In re Fritsch*, 23 USPQ 2D 1780, 1784 (Fed. Cir. 1992).

The Examiner's Answer alleges that the instant claims recite product-by-process limitations and that the claimed and prior art products of Myles are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes. As a preliminary matter, Appellants respectfully submit that at least claims 47-58 are not directed to a product-by-process. With regard to any remaining pending claims which are directed to product-by-process, Appellants respectfully submit that the products disclosed by Myles are not identical or substantially identical to those claimed by Appellants. In this regard, Myles provides no teaching or suggestion whatsoever, of an insulation material for an automotive exhaust gas treatment device having about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of greater than 200 Å to about 500 Å which is capable of exerting a minimum residual pressure for holding a fragile structure within a housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C as in independent claims 1 and 12. Nor is such an insulation material inherent from the teachings of Myles for the reasons stated above.

The Examiner's Answer alleges that one of ordinary skill in the art would have considered the crystallniity and crystallite size of the ceramic fibers to be a result effective variable. Specifically, the Examiner's Answer cites to column 3, lines 35-58 of Myles which teaches:

> "The preferred sufficient temperature is therefore between 1050°C and 1240°C. At temperatures above 1240°C, the crystal structures become rapidly too large thus making the fiber brittle … Sufficient time and sufficient temperature are inversely independent thus the higher the sufficient temperature, the shorter the sufficient time which is required to form microcrystals. Times should not be used which are sufficiently long to cause macrocrystal formation in the fiber which cause embrittlement; therefore, after a fiber is held at the sufficient

temperature for a sufficient time to cause microcrystal growth, the fiber is cooled below 960°C before macrocrystals can form."

The Examiner's Answer next alleges that one having ordinary skill in the art would have routinely optimized the heating time and temperature ranges to produce ceramic fibers having a suitable crystallinity and crystallite size without forming macrocrystals which cause embrittlement in order to obtain a support element/mat having the desired flexibility and shrink resistance for holding the fragile structure in Robinson. Myles, however, fails to provide any teaching or suggestion whatsoever that the heating time and temperature parameter is capable of being adjusted in order to obtain a support element or mounting mat which is sufficiently flexible and shrink resistant for use within an exhaust gas treatment device. As mentioned above, Myles is directed solely to furnace insulation which does not require the same physical demands as a mounting mat does for supporting a fragile structure within an exhaust gas treatment device.

In addition, claims 1, 12 and 47 also recite that the support element exerts a minimum residual pressure for holding the fragile structure within the housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C. Therefore, assuming the Office's premise to be true, one of ordinary skill in the art with knowledge of Myles at the time of the present invention, would also have to discover the optimum or workable ranges for a support element having the claimed values for holding pressure in addition to crystallinity and crystallite size. Considering that Myles is directed solely to furnace insulation wherein holding pressure is not an issue and that Myles provides no teaching or suggestion whatsoever of obtaining a fiber having a particular holding pressure, Appellants respectfully submit that such modifications to Myles would be beyond what would be considered to be routine skill in the art of furnace insulation. Where the prior art has not recognized the "result-effective" capability of a particular invention parameter, no expectation would exist that optimizing the parameter would successfully yield the desired improvement. *In re Antonie*, 559 F.2d 618, 619 (CCPA 1977).

The Examiner's Answer alleges that Sasaki was merely relied upon to provide additional support to Robinson for maintaining a minimal shot content in ceramic fibers, in order to maintain a uniform thermal conductivity in the support element/mat (with respect to claims 7, 18 and 51), and its general teaching of applying needling to a support element/mat of ceramic fibers, in order to increase its bulk density and to prevent the separation or shifting of layers (with respect to claims 41-44).

However, in determining the differences between the prior art and the claims, the question under 35 U.S.C. §103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983) (claims were directed to a vibratory testing machine (a hard-bearing wheel balancer) comprising a holding structure, a base structure, and a supporting means which form "a single integral and gaplessly continuous piece." *Nortron* argued the invention is just making integral what had been made in four bolted pieces, improperly limiting the focus to a structural difference from the prior art and failing to consider the invention as a whole. The prior art perceived a need for mechanisms to dampen resonance, whereas the inventor eliminated the need for dampening via the one-piece gapless support structure. "Because that insight was contrary to the understandings and expectations of the art, the structure effectuating it would not have been obvious to those skilled in the art." 713 F.2d at 785, 218 USPQ at 700 (citations omitted).).

As in *Schenck v. Nortron Corp*, Appellants' insight is contrary to the understanding and expectations of the cited art. As mentioned above, Sasaki is directed to a holder (a.k.a. a support element or mounting mat) for an exhaust gas purifying device which holds a honeycomb type catalyst in a catalyst casing. See Sasaki at Paragraph [0001]. Sasaki teaches in paragraph [0007] that when the shot content, with 45μm diameter or greater exceeds 5% by weight, the specific gravity of portions of the holder increases causing the thermal conductivity to become uneven and results in a loss of the holder's ability to evenly hold a honeycomb type catalyst. Myles, however, is directed to insulation for high temperature furnaces. As stated above, Myles does not teach that its fiber are useful in any application other than furnaces, or

that its fibers might be used in mechanically or thermally dynamic environments, such as in automotive exhaust gas treatment devices. Furthermore, Myles does not disclose that the fibers have the mechanical properties needed during normal operation in the environments described in Sasaki as well as Robinson, namely, catalytic converters and diesel particulate traps. Thus, it is unlikely that a person of ordinary skill in the art at the time of the invention would look to Sasaki to deduce any advantages that reducing the shot content of the fibers of Myles may have on improving the holding force of the Myles fibers when used within an exhaust gas treatment device when Myles does not even address support elements or mounting mats for exhaust gas treatment devices. Therefore, there is no reasonable basis upon which to base a prediction that reducing the shot content of the fibers of Myles in such applications would succeed.

Conclusion

For all of the above reasons, Appellants respectfully submit that independent claims 1, 12 and 47 are not taught or suggested by any combination of Robinson, Myles and Langer. Appellants submit that, since claims 1, 12 and 47 are patentable over the combination of Robinson, Myles, and Langer for the above reasons, claims 2, 5, 6, and 8-11, which depend from claim 1, claims 13, 16, 17, and 19-27, which depend from claim 12, and claims 48-50 and 52-57, which depend from claim 47 are also patentable over the combination of Robinson, Myles and Langer. *See In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed Cir. 1988). ("If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP § 2143.03 at page 2100-142.) Appellants therefore respectfully request that the 35 U.S.C. § 103(a) rejection of claims 1, 2, 5, 6, 8-13, 16, 17, 19-27, 47-50 and 52-57 be withdrawn.

For all of the above reasons, Appellants further respectfully submit that claims 7, 18, 41-44 and 51 are not taught or suggested by any combination of Robinson, Myles, Langer and Sasaki. Claims 7 and 41-42 ultimately depend from and incorporate the features of claim 1, claims 18 and 43-44 ultimately depend from and incorporate the features of claim 12, and claim 51 depends from and incorporates the features of claim 47. Because the combination of Robinson, Myles and Langer do not teach or suggest the subject matter of claims 1, 12 and 47, Appellants respectfully submit that Robinson, Myles and Langer do not teach or suggest the

subject matter of claims 7, 18, 41-44 and 51 before one even considers Sasaki. Appellants further submit, based on the reasons set forth above, that even if Sasaki is considered in combination with Robinson, Myles and Langer, that the combination still does not teach or suggest the subject matter of claims 7, 18, 41-44 and 51. Appellants therefore respectfully request that the 35 U.S.C. § 103(a) rejection of claims 7, 18, 41-44 and 51 be reversed.

Appellants submit that the remarks presented hereinabove overcome the 35 U.S.C. § 103(a) rejection of all pending claims. Appellants respectfully request that the Office reverse the rejection of these claims, and issue a formal Notice of Allowability of claims 1, 2, 5-13, 16-27, 41-44 and 47-57 over the art of record.

Based on the remarks set forth above, Appellants respectfully request that a Notice of Allowance be issued for claims 1, 2, 5-13, 16-27, 41-44 and 47-57. Should the Examiner have any questions regarding the remarks presented in the present response, Appellants' undersigned attorneys would welcome a telephone call.

Respectfully submitted,

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